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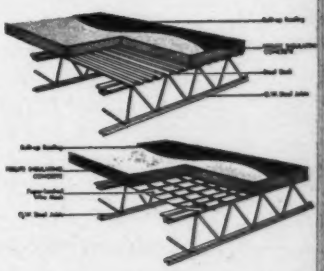
MARCH 1961

COMING NEXT MONTH

Cement Mason's Manual—Part VI. The concluding installment in this series will take up the causes and prevention of such common concrete surface defects as scaling, crazing and dusting.



Perlite Concrete. Another important contender in the field of ultralightweight concrete is perlite roof deck and insulating concrete. The properties of the material, and the special techniques required in working with it, will be covered in this article.

Latex Modified Concrete for Resurfacing. The old job of patching and repairing concrete takes on new dimensions when synthetic latex modifiers are added to ordinary mortar to provide an excellent new patching material. This article will review the use of this material.

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Over 36,000 copies mailed. Edited for all who are concerned with quality, job placed concrete (including prestress, tilt-up, lift slab, and thin-shell)—its specification, production, handling, forming, reinforcing, placing, finishing and curing: *Concrete Contractors, General Contractors, Engineers, Architects, Industrial Construction and Maintenance Men, Highway Engineers, Ready-Mix and Prestressed Concrete Producers.*

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special surface finishes

EXPOSED AGGREGATE

A colorful exposed-aggregate surface is often chosen for patios, garden walks, perimeter walks around swimming pools, and driveways (Fig. 54)—or for any area where a decorative, rustic effect is desired. If the surface is ground and polished it is especially suitable for such places as entrances, interior patios and recreation rooms.

The selection of the aggregates is highly important and test panels should be made before the job is started. Colorful gravel aggregate, quite uniform in size—usually ranging from 1/2 in. to 3/4 in.—is recommended. Avoid flat, sliver-shaped particles or aggregate less than 1/2 in. in diameter because they may not bond properly or may become dislodged during exposing operations. Exposing the aggregate used in ordinary concrete is generally unsatisfactory, since this will just give an unattractive, rough concrete surface.

A 5½- to 6-sack concrete with a maximum slump of 3 in. should be used. Immediately after the slab has been screeded and darbied, the selected aggregate should be scattered by hand and evenly distributed so that the entire surface is completely covered (Fig. 50). The initial embedding of the aggregate is usually done by patting with a darby or the flat side of a 2x4 (Fig. 51). After the aggregate is quite thoroughly embedded, and as soon as the concrete will support the weight of a mason on kneeboards, the surface should be hand floated using a magnesium float or darby (Fig. 52). This operation should be performed so thoroughly that all aggregate is entirely embedded just beneath the surface. The grout should completely surround and slightly cover all aggregate, leaving no holes or openings in the surface.

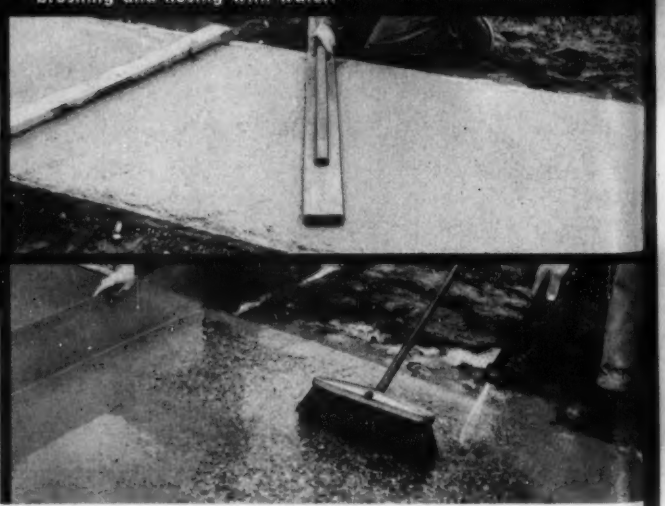
Shortly following this floating a reliable retarder may be sprayed or brushed over the surface, following the manufacturer's recommendations. On small jobs a retarder may not be necessary. Retarders are generally used on large jobs for better control of exposing operations. Where a retarder has been used, exposing of the aggregate is usually done some hours later by brushing and hosing with water. However, the manufacturer's recommendations should be followed closely.

FIG. 50. The selected, decorative aggregate is distributed to cover the entire surface evenly.

FIG. 51. The initial embedding of the aggregate.

FIG. 52. Darbying the surface to completely cover the aggregate with grout.

FIG. 53. Exposing the aggregate is done by simultaneously brushing and hosing with water.



This article is an authorized reprint from the *Cement Mason's Manual*, a new publication of the Portland Cement Association.

Whether or not a retarder has been used, the proper time for exposing the aggregate is quite critical. It should be done as soon as the grout covering the aggregate can be removed by simultaneously brushing and hosing with water (Fig. 53), yet not overexpose or dislodge the aggregate. If, during exposing, it is necessary for masons to move about on the surface, kneeboards should be used gently. If possible, this should be avoided because of the risk of breaking aggregate bond.

For interior areas, or where a smooth surface is desired, no retarder is used and exposure of the aggregate is accomplished entirely by grinding. This may be followed by polishing, which will give a surface similar to terrazzo.

Because the aggregate completely covers the surface, tooled joints in this type of work are quite impractical. Decorative or control joints are best accomplished by sawing. Control joints should be cut from 4 to 12 hours after the slab is placed. They should be at least one-fifth the depth of the slab. A small-radius edger should be used before and immediately after the aggregate has been embedded to provide a more attractive edge to the slab. Another method of providing control joints is to install permanent strips of redwood before placing concrete.

In another method of placement, a top course containing the special aggregate and usually 1 in. or more thick, is specified.

Exposed-aggregate slabs should be cured thoroughly. Care should be taken that the method of curing used does not stain the surface. Straw, earth and some types of building paper may cause staining.

FIG. 54. When completed the exposed aggregate surface adds to the beauty of a home.

DRY-SHAKE COLOR SURFACE

This is a colored concrete surface that may be used for showrooms, schools, churches, patios, decorative walks, driveways or any areas where a colored surface is desired.

It is made by applying a dry-shake material that may be purchased from various reliable manufacturers ready for use. Its basic ingredients are mineral oxide pigment (none other should be used), white portland cement and specially graded silica sand or fine aggregate. Job selecting, proportioning and mixing of a dry-shake material is not recommended.

After the concrete has been screeded and darbied, and free water and excess moisture have evaporated from the surface, the surface should be floated, either by power or by hand float. If by hand, a magnesium or aluminum float should be used. Preliminary floating should be done before the dry-shake material is applied to bring up enough moisture for combining with this dry material. Floating also removes any ridges or depressions that might cause variations in color intensity. Immediately following this floating operation, the dry-shake material is shaken *evenly* by hand over the surface. If too much color is applied in one spot, nonuniformity in color and possibly surface peeling will result.

The first application of the colored dry-shake should use about two-thirds of the total amount needed (in pounds per square foot as specified). In a few minutes this dry material will absorb some moisture from the plastic concrete, and should then be thoroughly floated into the surface, preferably by a power float. Immediately following this, the balance of the dry-shake should be distributed evenly over the surface. This should also be thoroughly floated and made part of the surface, taking care that a uniform color is obtained.

All tooled edges and joints should be "run" before and after the applications.

Shortly after the final floating operation, the surface should be power troweled. If work is being done by hand, troweling should immediately follow the final floating. After the first troweling, whether by power or by hand, there should be a lapse of time—the length depending upon such factors as temperature, humidity, etc.—to allow the concrete to increase its set. After this lapse of time, the concrete may be troweled a second time to improve the texture and also produce a denser, harder surface.

For exterior surfaces, a second troweling is usually sufficient. Then a fine, soft-bristled push broom may be drawn over the surface to produce a roughened texture for better traction under foot. Smooth surfaces are slippery and hazardous when wet. For interior surfaces a third hard troweling could be specified. This final troweling should be done by hand to eliminate any washboard or trowel marks. This final hand troweling produces a smooth, dense, hard-wearing surface.

FIG. 55. Random scoring using a piece of S-shaped copper tubing.

FIG. 56. Troweling the surface.

FIG. 57. Adding the finishing touches with a soft-bristled paint brush.

FIG. 58. Making leaf impressions in the surface with a finishing trowel.

Colored slabs, as with other types of freshly placed concrete, must be cured thoroughly.

After thorough curing and surface drying, interior surfaces may be given at least two coats of special concrete floor wax containing the same mineral oxide pigment used in the dry-shake. This wax is also available from various reliable manufacturers. Care should be taken to avoid any staining, such as by dirt or foot traffic, during the curing or drying period and before waxing.

GEOMETRIC DESIGN

The concrete surface may be scored or tooled with a jointer in various decorative patterns. This is commonly done for patios, garden walks and areas around swimming pools.

After the concrete has been screeded and darbied and excess moisture has left the surface, it should be scored in random geometric designs. This may be done by using a jointer or groover, or a bent piece of 1/2- or 3/4-in. pipe, preferably copper, about 18 in. long (Fig. 55). The random scoring by the pipe tool appears as recessed joints in the slab. The tool is similar in shape to the S-shaped jointing tool used in masonry work. One radius end of this is worked into the concrete to produce a scoring approximately 3/4 to 1 in. wide and 3/8 in. deep. This should be done while concrete is still very plastic, allowing coarse aggregate to be pushed aside by the tool and embedded into the slab. The first jointing operation will leave burred edges. After the excess moisture or water sheen has disappeared, the entire area should be floated and the jointing tool run again to produce neat joints. Then the surface should be carefully troweled (Fig. 56). After the concrete has set sufficiently, it should be lightly brushed with a very fine-bristled broom. The joints may be cleaned by brushing with a soft-bristled paint brush (Fig. 57). No water is to be used during brushing operations.

The concrete should be thoroughly cured.

LEAF IMPRESSION

This is a special surface which may be used as a border around a patio or along the edges of a garden walk. It is a highly decorative design and adds interest as a conversation piece.

Leaves are taken from local trees, preferably from those on the premises. Immediately after the concrete has been floated and troweled, the leaves should be pressed carefully, stem side down, into the freshly troweled concrete. This is most easily done by using a cement mason's finishing trowel. The leaves should be so completely embedded that they may be troweled over without dislodging them, but no mortar should be deposited over the leaves (Fig. 58). After the concrete has set sufficiently, the leaves are removed.

Thorough curing is necessary after the concrete has set so the surface will not be marred.

CIRCLE DESIGN

This is an interesting surface that can be used in many ways, such as a border around a patio slab, over the entire concrete slab, or in alternate squares. Circles of different sizes and overlapping circles add interest.

After the concrete has been placed, struck off, darbied, floated and steel troweled, the surface is ready to be given the circle design.

Using any number of circular-shaped cans of various sizes (starting with the largest size chosen), press the open end of the can into the freshly troweled surface and give the can a slight twist to ensure a good impression. After making a number of large circle impressions, take the next size can and repeat the operation. Continue this until the desired number and sizes of circle impressions have been made (Fig. 59).

If the slab is exposed to the weather, the surface should be given a lightly brushed nonskid finish.

The slab must be moist cured.

SWIRL DESIGN

A nonskid surface texture that can be decorative as well as functional is the swirl design.

This swirl texture can be produced on a slab by using a magnesium or aluminum float or a steel finishing trowel. When a float is used the finish is called a swirl float finish, and when a trowel is used the finish is called a swirl trowel finish.

After the concrete surface has been struck off, darbied, floated and steel troweled, the surface is ready to be given either the swirl float or swirl trowel finish.

The float should be worked flat on the surface in a semicircular or fan-like motion. Pressure applied on the float with this motion will give a rough-textured swirl design as shown in Fig. 60.

With the same motion but using a steel finishing trowel, held flat, the cement mason can obtain a finer textured swirl design on the concrete surface (Fig. 61).

Moist curing of the slab is the final operation.

WAVY BROOM DESIGN

The wavy broom design may be used to add interest to a nonskid textured surface. This design is given to the surface after all the conventional operations of striking off, darbying, floating and troweling have been done. The broom is drawn across the slab in a wavy motion (Fig. 62). The coarse texture is obtained by using a stiff-bristled broom; a finer texture may be achieved by using a soft-bristled broom.

After the concrete has set sufficiently so that this surface texture will not be marred, the slab must be moist cured.

KEYSTONE FINISH

This is a special finish which has a travertine-like texture. It can be used for a patio, garden walk, driveway,

FIG. 59. Making a circle design on a concrete surface.

FIG. 60. Swirl design on a concrete surface made with an aluminum float.

FIG. 61. Swirl design on a concrete surface made with a steel finishing trowel.

FIG. 62. Wavy broom design on a concrete surface made with a stiff-bristled broom.

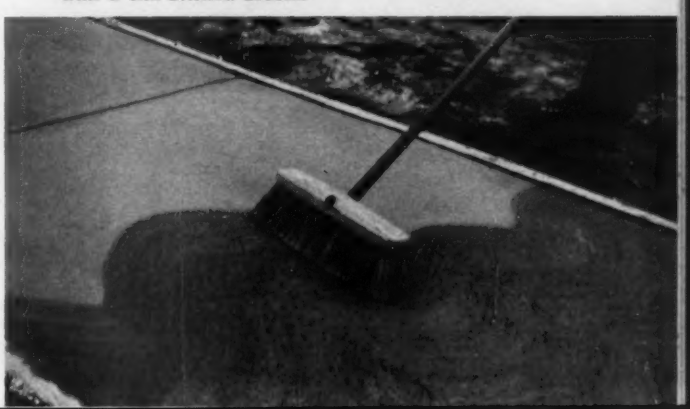


FIG. 63. Travertine finish, commonly called keystone finish.

FIG. 64. This random-scored keystone finish makes an attractive patio area.

perimeter around a swimming pool or any location where an unusually decorative flat concrete surface is desired.

After the concrete slab has been struck off, darbied and edged in the usual manner, the slab is broomed with a stiff-bristled broom to ensure bond when the finish (mortar coat) is applied.

The finish coat is made by mixing 1 sack of white portland cement and 2 cu.ft. of sand with about 1/4 lb. of color pigment (usually yellow is used to tint the mortar coat, but any mineral oxide color may be used). Care must be taken to keep the proportions exactly the same for all batches. Enough water is added to make a soupy mixture having the consistency of thick paint.

This mortar is placed in pails and thrown vigorously on the slab with a dash brush to make an uneven surface with ridges and depressions. The ridges should be about 1/4 to 1/2 in. high. The surface is allowed to harden enough to permit a cement mason on it with kneeboards.

The slab is then troweled with a steel trowel to flatten the ridges, leaving the slab surface smooth in some places and rough or coarse grained in the low spots. Depending upon the amount of mortar thrown on the slab and the amount of troweling done on this mortar coat, many interesting textures can be produced (Figs. 63 and 64). The slab should then be scored into random geometrical designs before curing.

LEWIS H. TUTHILL

ROGER H. CORBETTA

1961 OFFICERS ELECTED BY ACI

St. Louis, February 22—Lewis H. Tuthill, Sacramento, California, is the new president of the 10,300-member American Concrete Institute. Mr. Tuthill's election was announced today at the 57th annual convention of the Institute being held at the Chase-Plaza Hotels February 20-23.

At the same time, the election of Roger H. Corbetta, New York City, to a 2-year term as vice-president was announced, along with the installation of Arthur R. Anderson, G. E. Burnett, Chester P. Siess, and Anton Tedesko as new members of the ACI Board of Direction.

Mr. Tuthill, concrete engineer with the Division of Design and Construction, California State Department of Water Resources, succeeds Prof. Joe W. Kelly, University of California, Berkeley.

Mr. Tuthill has been continuously engaged in design and construction work on irrigation, water supply, and dam construction projects.

Roger H. Corbetta, the newly-elected vice-president, heads the Corbetta Corporation of New York and Chicago. An energetic supporter of ACI activities since joining in 1941, he represents the Institute on the Concrete Industry Board of New York City, an organization he helped found.

Mr. Corbetta has also been identified with precast concrete structures and prestressing methods since 1920 and has pioneered in the field of thin shell concrete construction.

In addition to Mr. Corbetta, Raymond C. Reese begins his second year as an ACI vice-president. Mr. Reese, elected to a 2-year term in 1960, is principal of R. C. Reese & Associates, consulting engineers, Toledo, Ohio.

TESTING PAYS

BY THEODORE W. VAN ZELST*

You don't have to spend great amounts of money to give yourself and your customers the protection of a testing program

REMEMBER THE MANY NEWSPAPER AND PHOTO STORIES showing the dramatic failure of a reinforced concrete building in Rio de Janeiro? The pictures showing collapse of a concrete bridge abutment in Alaska? The collapse of a building under construction in Montreal? Remember the many photographs and stories of local foundation failures, collapses of retaining walls, large earth embankment slides and other failures during construction?

These failures were all dramatic! Behind the scenes they represented losses of millions of dollars to engineers, to contractors and to owners.

Many failures can be traced to improper design and evaluation of the foundation of the structure. This usually is tied in with a lack of knowledge of the sub-surface conditions. Other failures are caused by poor quality of materials used in concrete construction and by improper drainage or preparation of the foundation. Whatever the cause, every failure must be a matter of concern to everyone in the industry . . . the designing engineer, architect, concrete producer, supplier, contractor, owner, financier. Failure involves everyone and costs everyone.

In recent years contractors, owners and architects who are not normally involved in testing and quality control on a regular basis have nevertheless become interested in testing programs. These groups have come to recognize the need for quality control testing for their own protection.

It does a contractor no good to closely follow job specifications if the footing he places is going to fail because of poor soil conditions. When there is a failure, the contractor shares the grief and loss with everyone else concerned.

Many contractors have been using sets of basic equipment to evaluate subsoil conditions prior to bidding. Although this information is frequently furnished with contract documents and plans, wise contractors now frequently make their own analysis of the site by using hand or power tools, placing holes and borings and taking soil samples for their own inspection. With a combination of accurate analysis and experience in handling various types of soil in construction, they can bid more intelligently on excavation and material handling, compaction and other problems concerned with maintaining the excavation in a dry condition or with maintaining the slopes during construction.

(MORE)

*The author is president of Soiltest, Inc.

Nuclear devices are being used for precise measurements of soil moisture and density. These units can be used on the job location without disturbing any of the material under test. The nuclear probe is connected to the portable scaler and is placed on the soil surface to make the measurements. Considerable time savings can be realized by contractors, engineers and governmental agencies through the use of these instruments.

LEFT: One of the most popular new field check instruments is the pocket penetrometer. An indication of the strength or bearing capacity of a cohesive soil can be obtained in a few seconds. The pentrometer can also be used to classify soils by relative strength.

RIGHT: Small size testing instruments are extremely popular as indicator devices. The small concrete air indicator is widely used for a fast field determination of approximate air entrainment in concrete.

The necessary equipment for this type of testing is low in cost and can be carried easily in the trunk of a passenger car. There are kits available to take hand borings down to depths of approximately 25 feet.

A small instrument, the pocket penetrometer, is frequently used to classify the materials taken in borings. This instrument is accurate enough to give a proper classification to cohesive types of materials and it is widely used by engineers and contractors for field evaluation of soil strengths. Of course, there are many other problems involved in the evaluation of soil and stability for construction purposes.

During construction, other basic testing techniques and procedures may be used by the contractor. Where the problems are greater than those outlined in the job specifications or plans, a contractor should have a testing engineering firm make a further analysis to protect his interests. Usually there is no difficulty in obtaining permission from the owner to make such studies prior to the bid date. A few hundred dollars or so spent on this type of investigation prior to placing a bid can frequently save tens of thousands of dollars.

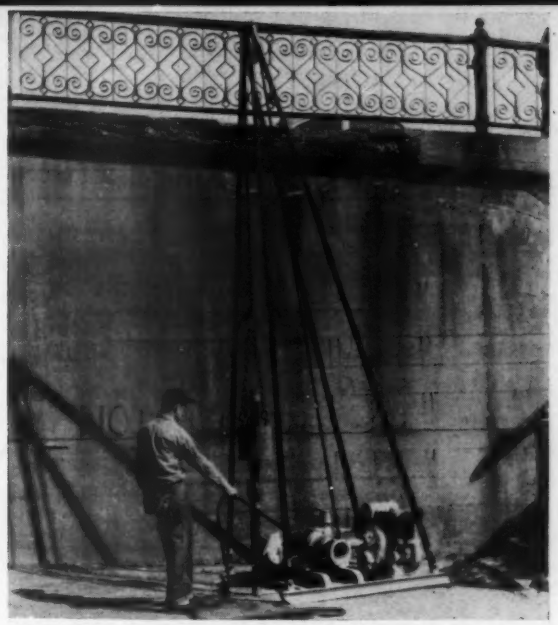
A wise contractor will perform some of these easily conducted tests himself at the job site without waiting for results to come from a testing laboratory. It does no good to place a slab or foundation with concrete that is going to be rejected. Know before you pour that you are meeting the specifications and much trouble can be averted.

By running his own tests during the job, the contractor's engineer or foreman will have a much better idea of what it takes to produce a good test cylinder and what it takes to produce quality concrete. The end result is better concrete for everyone concerned. A low-cost instrument such as the concrete air indicator is widely used by contractors for a fast check of entrained air in concrete to make sure that the batch meets specifications. Many contractors use the more elaborate air meters of ½- or ¼-cubic foot capacity for an accurate check once or twice a day to make sure they are in line with specifications.

Contractors have come to realize that concrete produced far in excess of the required strength and performance specifications can be as costly to them as concrete not meeting the specifications. If a job is specified for 3000-pound concrete, profits are sure to take a dive if the contractor supplies 7000-pound concrete. With little basic training and experience, many simple tests can be performed right in the field to prevent this from happening.

On extensive projects, contractors and concrete producers may establish small field laboratories in which they perform many of the basic concrete tests, up to actual compression testing of 6- by 12-inch concrete test cylinders. Just before placing concrete for a footing or foundation slab, many contractors will use the pocket penetrometer described earlier for a quick reading on the bearing capacity of the soil. This penetrometer reads in tons per square foot of bearing capacity of cohesive types of soils (clay or claylike materials). Therefore, if a footing is designed for a soil bearing capacity of 2000 pounds per square foot, a quick check can be made to assure that the materials on which the concrete is being placed are at least of this strength.

Some construction specifications call for small diameter auger holes (about ½ inch in diameter) to be made at each footing to make sure that there are no pockets of detrimental material which will cause settlement of the footing under load. Even in the absence of a specification requirement many contractors make auger checks because they provide so much protection for so little cost.



RIGHT: Driving winch used to obtain samples of soil for classification and laboratory strength tests. The samples are obtained in a thin wall tube or in a split sectioned sampler which is driven using the drop hammer.

Often a contractor is required to place concrete for a floor slab or foundation on material which has been compacted to a certain degree of compaction. There are means of making quick density tests in the field using either the sand cone method or a balloon-type volume measure. These tests will enable the contractor to get relatively fast readings of the density of the materials and to make sure that it meets the specifications.

There is no economic sense in a contractor placing concrete on improperly compacted bases. Concrete will crack under such conditions, and regardless of who was responsible for the compaction of the base, the concrete contractor is guilty!

So a few relatively simple soil and concrete tests can be used on all types of projects for fast quality control. The testing equipment used in this type of work is low in cost. An instrument such as the pocket penetrometer costs approximately $15.00. The air indicator is even less, about $10.00. Sieves run up to approximately $10.00 each, a yield bucket $20.00, a sand cone and related equipment in the range of $60.00 to $70.00. So the cost of quality control equipment is not high. An important feature to remember is that all of this equipment can be used on many jobs. Most testing equipment will last for many years with proper care.

How large must the job be to justify testing? Many constructors of low-cost homes have found it economical and profitable for them to engage in some of the testing techniques noted above. They have been concerned to make sure that the end product is a quality one, and testing has helped them achieve this important goal. The small amount of testing necessary to guard against inferior materials or site conditions will do much to increase job profits.

Testing is insurance . . . it guards against costly failures and reputation damage. Testing pays!

END

The Volumeasure is used to determine the in-place density of soils by the rubber balloon method. The Volumeasure consists of a calibrated glass cylinder, guard, actuator bulb, rubber balloon and base plate. Liquid contained in the glass cylinder is pumped into the balloon which expands to fill the hole from which a test sample has been removed. Apparatus of this type is restricted to tests of relatively firm, bonded soil masses.

VERMICULITE ROOF DECK AND INSULATING CONCRETE

VERMICULITE, a mineral that has few uses in its crude state, becomes, when heated and exfoliated, an expanded light aggregate of great value in the production of lightweight fill and insulating concrete. Since the 1920's, the mining and processing of vermiculite has grown to a better than $30 million a year industry.

Compared with conventional aggregates, the price of vermiculite aggregates is relatively high; but the use of vermiculite concrete can result in significant savings in weight of steel. It is also more fire resistant and has heat and sound insulating properties considerably superior to those of conventional concrete. Vermiculite's thermal conductivity (K factor), ranges from 0.6 to 0.97 BTU per hour per square foot (degrees F. per inch), depending mainly on the mix ratio. The lighter the concrete, the better (lower) the K factor.

Vermiculite has been found in twelve states and is mined commercially in seven. A soft, laminated, mica-like material in its raw form, vermiculite is graded at the mine according to the finished products desired. The crude vermiculite is crushed, cleaned, dried and sized, and the resulting concentrate is shipped to processing centers, where it is exfoliated in furnaces at temperatures of 1800 to 2000 degrees F.

Since vermiculite is low in weight but high in bulk, long distance shipment is uneconomical. Consequently, expanding plants have been established at market centers to process the screened and cleaned material from the mine.

The most common use of vermiculite lightweight concrete is for light, structural roof decks, and for insulation fill over metal decking and structural concrete. Vermiculite for roof decks can be placed over various kinds of form boards—fiber, glass fiber, acoustical, and cement-asbestos—as well as over paper backed wire lath. Vermiculite concrete is highly adaptable for concrete roof systems. Almost any architectural requirement can be met by changing the type of form, slab thickness, concrete mix, or support spacing. Drainage slopes can be incorporated into one monolithic surface and the concrete can be placed on steep inclines.

The recommended mixture of vermiculite concrete for roof deck construction is 1 : 4. Vermiculite is usually sacked in units of 4 cubic feet each. A 1 : 4 mix will give a density of 35 to 40 pounds per cubic foot, and compressive strength of 350 to 500 psi. The indentation resistance will be 410 to 515 psi, and the rupture modulus, 180 to 205 psi.

Vermiculite, like other insulation materials, works in two ways: it keeps heat within a building in winter and it keeps heat out in summer. Material that insulates well results in greater comfort for those who use the building, lower initial costs in air conditioning and heating equipment, and lower operating costs for that equipment.

For concrete roof insulation, vermiculite mixes of 1 : 6 and 1 : 8 can be used. When the necessary roof live load is less than 30 pounds per square foot, and the temperature is above 40 degrees F., the 1 : 8 mix is recommended. The properties of each mix are shown in the table below:

	1 : 6	1 : 8
Density	25- 30 lbs./cu.ft.	20- 25 lbs./cu.ft.
Compressive strength	125-225 psi	100-125 psi
Indentation resistance	165-270 psi	100-145 psi
Rupture modulus	120-135 psi	45- 90 psi

The heat-resistant qualities of vermiculite lightweight concrete also provide considerable fire protection. Factors affecting fire resistance are the resistance of concrete to the flow of heat, its thermal expansion, and its chemical and mechanical stability. Concrete's fire-protective function ranges from that of supporting loads during and after a fire, to that of serving as expendable, insulative protection for structural steel from high temperatures during a fire. Vermiculite is an incombustible insulation, and in addition it serves as a buffer between combustible roofing materials

Pumping a 1:6 mix of vermiculite insulating concrete 4 inches thick on the gable roof of a supermarket. Almost any architectural requirement can be met by changing the type of form, slab thickness, concrete mix or support spacing, and steep inclines can be dealt with readily.

and materials used in the interior of a building. Fire resistance ratings up to 4 hours are attainable for various vermiculite roof assemblies. Good ratings are also possible for vermiculite-coated, load-bearing walls. Here, however, the required thickness depends on the nature and the amount of reinforcement and on the utilization of mixes possessing greater density and structural value than ordinarily required in roof-fill applications.

Needless to say, vermiculite concrete's fire rating means low insurance rates on buildings and contents, as well as maximum coverage on sprinkler heads if required.

Vermiculite concrete can be mixed in a horizontal-drum rotating-paddle type mixer. The water and cement are placed in the mixer, and then the aggregate. Mixing is limited to the minimum time required to obtain a thorough mix and proper fluidity. The maximum time recommended is five minutes. When transit mixed vermiculite concrete is used, the water and cement are placed in the mixer, which is rotated slowly until all the aggregate has been added. The drum continues to rotate for about one minute after the aggregate is in the mixer, but is not rotated on the way to the job site. At the job the concrete is mixed at the fastest speed until it is uniform and flows freely from the mixer.

In a rotating-paddle mixer, an increase of the speed of rotation will provide air entrainment and will reduce the quantity of air-entraining agent required. The total percentage of air entrained will depend on the size of mixer and the duration of mixing; the proper quantity of air entraining agent may have to be determined by trial and error for the particular mixer and the desired density.

Placement and screeding of vermiculite concrete should proceed immediately after mixing. The time between the final mixing and the placement should be sufficiently brief so as to allow no appreciable change in the consistency of the mix. Two inches is the recommended minimum thickness of vermiculite over form boards. Over cement-asbestos, 2¼ inches should be placed.

The procedure for curing vermiculite lightweight concrete is essentially the same as for curing conventional concrete. Vermiculite concrete should be substantially dry before the application of the roofing.

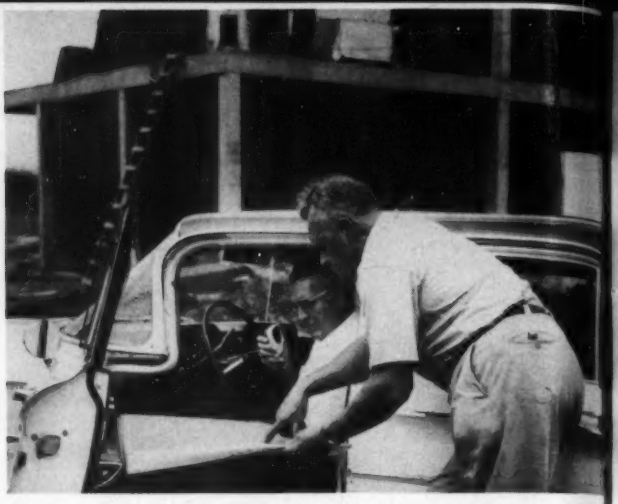
Concrete used for roof decking should have the following characteristics before it is ready for built-up roofing: (1) sufficient hardness to withstand foot traffic and normal roofing operations; (2) surface should be firmly bound and be free from loose material and extreme roughness; and (3) exposed surface should be a gray cement color and look and feel dry. In this state, the hot, mopped bond coat can be applied smoothly and it will adhere well to the surface.

As with expanded slag, clay, shale, and slate aggregates, the tendency of vermiculite aggregates to absorb water makes it difficult, if not impossible, to determine an accurate value for the net water/cement ratio.

Water requirements per cubic yard of vermiculite concrete do not vary greatly with proportions. In tests using proportions of 1 : 3 to 1 : 16, the range of water requirements was about 75 to 105 gallons per cubic yard of concrete. The mixes ranged from ⅛-inch to about 9-inch slump.

In summary, vermiculite lightweight concrete can result in overall savings despite the relatively high cost of the aggregate. Its lightness makes possible a reduction in the weight of steel, its insulating qualities reduce the initial and operating costs of air conditioning and heating equipment, and its fire-resistant properties result in greater fire protection and lower insurance rates. END

Contractor Improves Service with Radio Communication



Altherr and his top superintendent find that clearing up problems and coordinating activities by radio saves an hour on every job.

THE EXPERIENCE of a Homewood, Illinois, construction firm suggests that the two-way radio may provide the extra angle needed in today's concrete contract bidding. M. S. Altherr, owner of Altherr Construction Company, reports that the coordination and speed radio gives him has cut his operational expenses 10 percent, saved him up to an hour on every job and enabled him to give better service to his customers.

"In today's keen competition," Altherr points out, "a concrete contractor must do quality work as well as cover every angle to reduce the cost of each job. Meeting competition and being more efficient at it breeds success in any business. Radio gives me a tool I need to increase my efficiency as a concrete contractor."

Altherr's firm handles concrete work for industrial, commercial and residential projects in Chicago and its southern suburbs.

The network, which ranges to jobs 25 miles away, operates on a frequency of 151.805 megacycles and is isolated from others on the same frequency. Initial cost of the equipment, installed in early 1960, was approximately $4,000. The company expects it to pay for itself within 18 months of operation. Savings in time, coordination of operations and convenience make up the money saving benefits that cover the investment.

Radio enables the company to effect important time savings on every job. An everyday example of how this saving occurs is the coordination possible with radio between a concrete job and the supplier of ready mixed concrete. For example, a foreman may find, as a particular job nears completion, that he needs additional concrete. With radio he can pick up his mobile radio microphone right at the job, call the office and have the secretary place the order.

Requests for sand fill, forms from the company's yard or special equipment are handled in the same fashion. Radio makes it possible for the foreman to stay on the job with correspondingly less chance that his crew will stand idle waiting for materials to be delivered.

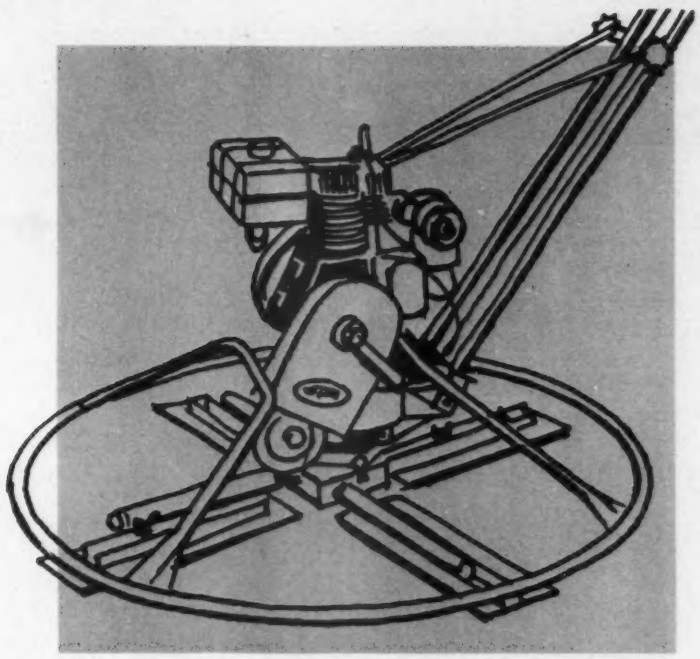
Intangible benefits, not so easily measured in the company books, are also gained from radio by the Homewood firm. One is the resources it puts on every project. Altherr makes the point that radio gives the contractor an office on every job. It makes it possible for him to know the up-to-the-minute progress of each job, what problems the men have run into and where his presence is required. With radio, he can be several places at once without driving extra miles supervising.

When trucks or equipment break down or get stuck in bad weather, radio can be used to get aid to put the gear back in commission as soon as possible and to cancel out ordered loads of perishable concrete—worth over $100 per load. Similarly, delays at the ready mixed concrete supplier's plant or by his trucks telephoned to Altherr's office can be instantly relayed to his crews, enabling the foreman to revise work plans to better utilize time and manpower.

Altherr currently plans to expand its radio system with another mobile radio in the truck used by the firm's finishing foreman. Also to be added to the network is a selective system which will enable the dispatcher to alert and talk to individual mobile units without bothering others in the system. The system's decoders in the mobile radios will then also be connected to the vehicle horn to signal the driver if a call comes in for him while he is away from his truck or car. Two-way radio has clearly won a firm and permanent place in this busy contractor's operations. END

Readers who would like to receive more information concerning the advantages of radio communication may request it by writing on their business letterheads to Concrete Construction Publications, Inc., P. O. Box 444, Elmhurst, Illinois.

FILE: Management



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We have lots of testimonials on the way STOW ROTO-TROWELS perform... statements from contractors telling us how they saved time and made money by putting STOW TROWELS on the job.

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Estimator's General Construction Manhour Manual. *By John S. Page. Published by Gulf Publishing Company, 3301 Buffalo Drive, Houston, Texas. $10.00.*

Here is a manual that presents an accurate and convenient method of estimating labor for complete general construction work in any given system, plant or location. The reader is thus given a dollar and cents perspective into the costs of field labor, the largest single variable in estimating construction work.

The manhour tables contain easy-to-use listings which are valuable guides to estimating manhours in every phase of general construction work. They are the result of hundreds of time-and-method studies, coupled with actual labor costs on numerous projects.

The manual points out how to arrive at composite rate using productivity efficiency and production elements. With the composite rate, manhour estimating can be applied to any general construction job. Thus a production efficiency percentage can be obtained by applying all known local conditions and variables and the entire labor rate for the craft or crafts involved in the various operations can be computed.

Areas covered in 17 sections include: demolition; site-grading and structural excavation; concrete roadways; sheet and steel and mesh; miscellaneous embedded items; concrete; masonry; structural steel and miscellaneous items; carpentry and millwork; metal doors; sash glass and ceilings roofing and siding; ornamental metal and special partition; painting.

Career Finder. *Published by Personnel Research, P. O. Box 38311, Los Angeles, California. $2.00.*

A job testing technique for fitting workers to jobs for which they are qualified, the Career Finder, is the result of research to determine the kind of traits, temperament, knowledge and skills necessary for success in each occupation. It serves as a single test in measurement of aptitudes, rather than requiring separate tests. The device is in slide-rule format, 8½ by 11 inches in size. It takes about one hour to complete the test without supervision, and six minutes to score. The Career Finder provides education, business and industry a tool of considerable objectivity in matching the qualifications of individuals with the specifications of any particular job.

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- ★ Only Screed Beam utilizing Laminated wood. It is stronger, more rigid, less apt to warp, and lighter in weight than solid wood or metal screed beams.
- ★ Dolly rollers have removable flanges for use on adjacent slabs.
- ★ End dolly design permits 8' variable width adjustment quickly, even while operating.
- ★ Telescoping handles provide adjustable height to suit operator.
- ★ Unique clamping design of beam in end dollies permits fine vertical adjustment. Vibration of forms is eliminated.
- ★ Enclosed dual V-Belt drive, Less downtime.
- ★ Retractable form scraper — Keeps forms clean for easy forward movement of Screed; automatically raises when backing up.
- ★ Pick-up handle on each dolly makes it easy to lift and carry.
- ★ Electric motor can easily be substituted for gasoline engine. Holes in plate are drilled for both.
- ★ Power Unit, End Dollies and Screed Beam can be purchased separately.

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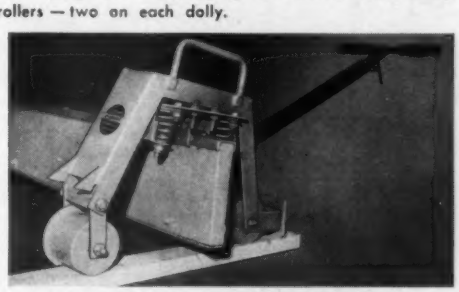
SPRING MOUNTING

Spring mountings isolate the end dollies from vibration. Vertical adjustment of beam keeps it from vibrating the forms. Whether striking off or backing up, the screed moves easily along on four rollers — two on each dolly.



EASILY RAISED FOR BACKING UP

Downward push on the pull handles causes the rear rollers to swing forward — automatically placing the beam in "raised" position for backing up. Then a pull on the handles moves the rollers back and up, placing the beam in normal operating position.

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BURKE FORM SEALER has proved its effectiveness on literally thousands of concrete construction jobs. This chemically processed solution of co-polymers and water-repellent resins—an exclusive Burke formula—seals and water-proofs the plywood form panels by controlled penetration. Dries overnight to a tough, alkali-resistant film that permits up to 10 or 12 pours with no retreatment. You get no retardation, no staining, no dusting problems, no transference or migration—just clean, smooth architectural concrete, pour after pour. Apply with *Burke Promel Roller*, power spray, brush (using regular formula) or by dipping (special dipping formula).

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books

Credit and Collection Letters: New Techniques To Make Them Work. *By Richard H. Morris. Published by Channel Press, Inc., Great Neck, New York. Sponsored by the National Association of Credit Management, 44 East 23rd Street, New York, New York. 296 pp. $5.95.*

The purpose of this book is to help you write effective collection and credit letters and still keep the goodwill of the problem customer. The book is not a basic course in grammar; it does not preach theory. It does offer a thorough grounding in composing letters that have a proven record of making collections faster and more efficiently.

Construction Horizons. *Published by Cleveland Engineering Society, 3100 Chester Avenue, Cleveland, Ohio. $2.00.*

This book is a condensed but comprehensive tabulation of material presented at the ninth annual construction conference of the Cleveland Engineering Society which should prove to be of tremendous value to engineers, architects, and construction men everywhere. It includes the 27 papers which were given during the meeting.

The following listing of titles of some of these papers will illustrate the type of subjects covered: Municipal Planning; Relations Between Owner, Architect, Contractor and Sub-Contractor; Legal Aspects of Construction Specifications; The Suburban Shopping Center; Epoxy Resins; Integrated Ceilings; Renovating vs. Razing and Rebuilding; Choosing the Right Construction Steel; New High-Strength Reinforcing Steel; Roadside Design for Safety; The Transformation of the Morgan Guarantee Trust Building; Programming Maintenance; Downtown Redevelopment.

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Designed for Salt Lake City Corporation by the architectural-engineering firm of Ashton, Evans and Brazier.

Christensen Bros., Salt Lake City, the builders, studied a number of forming systems. Symons Steel-Ply Forms were selected based on the recommendation of Earl Jensen, President of Contractors Equipment & Supply Company (Conesco), Salt Lake City.

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floating concrete?

A unique underwater theatre was recently installed at Florida's Silver Springs. The engineer who designed the theatre, Newton Ebaugh of Ebaugh & Goethe, Gainesville, and the contractor, Raymond Tassinari, also of Gainesville, used more than 300 tons of Gunite and concrete in the construction. The photo at the upper left shows workmen applying a 3-inch coating of Gunite (reinforced concrete) to the 125 ton steel hull to give it added weight and strength.

The theatre is 150 feet long, 13 feet wide and 14 feet high. It has 30 three by four foot plate glass windows along the front side below water level. Two gently inclined ramps at the rear join the structure with the shore. Several tons of concrete was placed in the interior of the theatre to bring it to the proper water level.

Steel work in the theatre was fabricated in six sections. These sections were bolted and welded together at a location in a manmade lake which joined the river and later towed upstream by seven outboard boats. The picture at the lower left shows the massive theatre being towed upstream to its permanent location. The mile trip was made in an hour.

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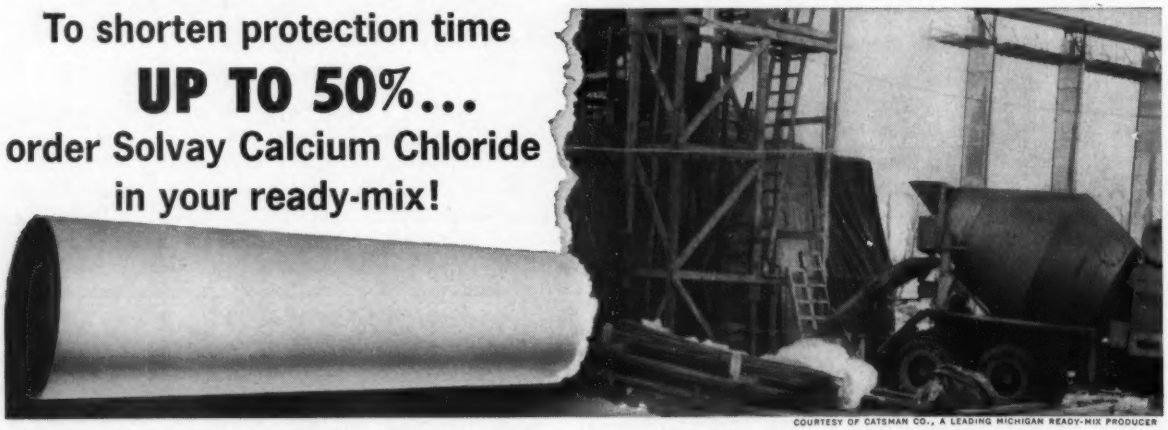

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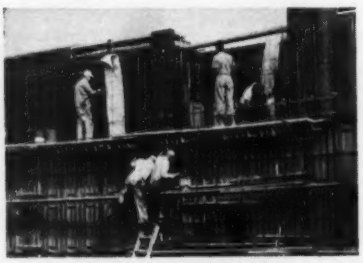
hurry-up job

Dominquez area of Calif. — With time drawing near for completion of a concrete flood control channel which had been under water for most of the year, fast action became the order of the day. The 4-inch slump concrete was struck off quickly by using a 30-foot screed with two power packs and an adjustable crown assembly, and power trowels were moved in to speed finishing.

Even though the concrete was poured in 90-degree heat with a strong, dry wind blowing, some "soup" was brought to the surface by the vibrating action of the screed. The cord visible in one of the pictures was dragged along behind the screed to pick up this material as it formed. With power screeding at the rate of 110 linear feet of channel per hour, the cost of this operation was cut from an estimated 11 cents to 3 cents per square foot.

The screed and rotary trowels were supplied by Stow Manufacturing Co., 443 State St., Binghamton, N.Y. The contractor was the J. A. Thompson Construction Co., Inglewood, Calif.



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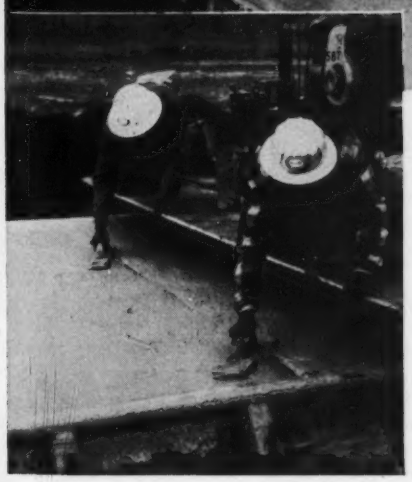
TRUCK MIXERS distributed concrete in uniform piles to facilitate single-pass spreading of 9″ paving slab. Longitudinal joint between 12′ lanes was formed by insert fastened to right rail. Contractor: Duval Engineering & Construction Co., Jacksonville, Fla.

OVERHEAD FRAME is pushed down to force asphalt filler strip from holding device into place in wet concrete. Smooth, even joint, without spalling, was formed later by sawing out top 1″ of filler and sealing with plastic.



AFTER STRIP WAS PLACED, machine was hand-cranked ahead to permit 2-man crew to hand-finish area around joint. Then rig moved 20′ to next dowel joint location and placed next strip.

Joint fillers inserted as they paved

On a section of Interstate 10, near Jacksonville, Fla., the usual paving train of spreader, finisher and float was immediately followed by a job-built two-man machine that placed and vibrated in ¼″ wide x 2″ deep asphalt-impregnated joint strips in the wet concrete.

This rig was hand-cranked along the forms to previously set dowel-joint locations. The filler strips were hydraulically driven into the concrete with enough vibration to displace the aggregate. Then the machine moved ahead to let the two-man crew hand-finish the joint before final surface finishing and burlap drag.

After the concrete cured, it was only necessary to saw out 1″ of the soft asphalt filler and pressure-seal the joint with plastic, a clean, low-cost operation.

A fleet of 7-yd. truck mixers delivered concrete to the subgrade to complete a full 9″ x 12′ unreinforced slab with a single spreader pass. The job required about 1,800 linear feet of 9″ forms to keep forms ahead of the paving train.

Concrete was processed to rigid Interstate highway requirements and delivered on exact schedule by truck mixers of certified design, capacity, mixing speed and water control accuracy.

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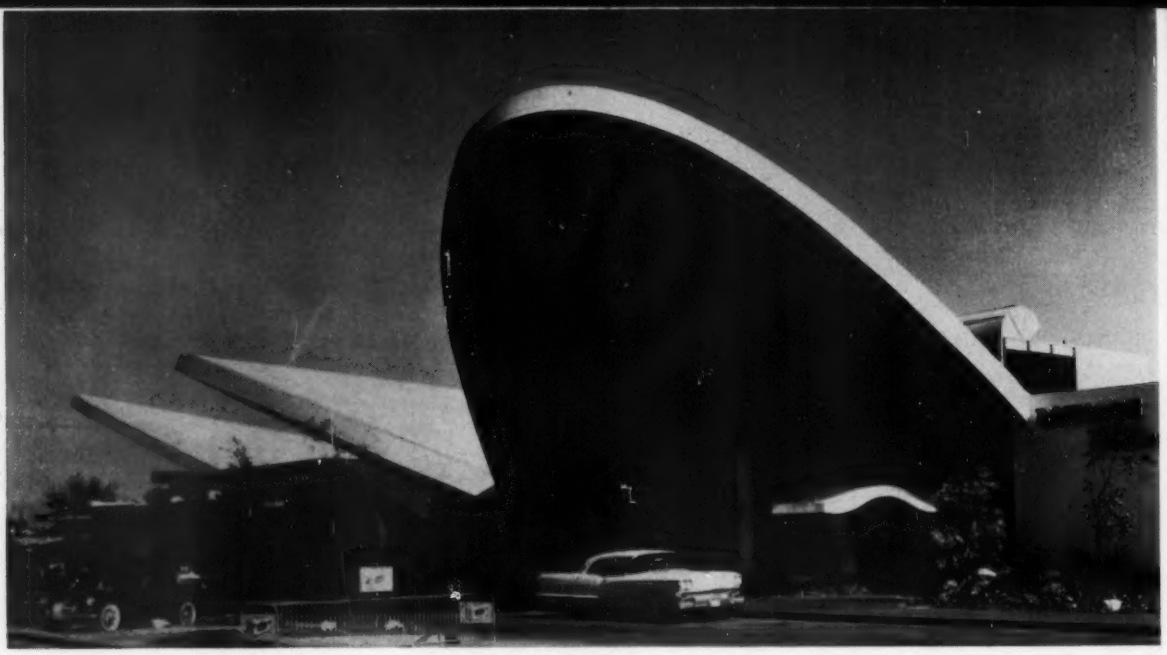

h/p roof gets new-type coating

Sacramento, Calif.—Color and weather protection were given to the eye-catching hyperbolic paraboloid roof of a country club through the application of a new type of elastomeric roof coating. The material is said to provide a skin-like surface to roof curves which is both fire and water resistant. It weighs only 1/25th as much as conventional roof coatings and comes in many colors.

Caram Elastomer coating material is made by Caram Manufacturing Co., Monrovia, Calif.

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CONSTRUCTION MACHINERY

Theodore M. Penker, Jr., Vice President, Penker Construction Company, Cincinnati, Ohio, (left) with Bert Melching, his Dodge Representative.

"We can bid lower because Dodge Reports do our prospecting for us"

"Without the advance notice of prospects for new work that Dodge Reports give us," says Mr. Penker, "we'd have to maintain a much larger sales force to provide the same kind of information. We figure that could add 5 to 10% to our cost of sales and advertising . . . which might make the difference between *losing* or *winning* an award!"

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Mr. Penker's company was formed in 1880 by his grandfather to build homes and small factories. Today it employs 300 to 400 men on various projects ranging from buildings to sewage, water and power plants, bridges, viaducts and highways. It is one of the three largest firms in southwest Ohio doing both engineering and building types of construction.

"Over the *35 years* that we've been using *Dodge Reports,*" Mr. Penker says, "their primary value to us has been the important advance news of new projects they provide. But they give us other benefits, too. They let the sub-contractors know which jobs we are bidding in plenty of time to submit *their* bids to us! What's more, Dodge Reports help us to know a large part of our possible market as much as two years ahead, thereby enabling us to plan on either curtailing or expanding our overhead, personnel and equipment requirements. This can be a vital factor in an operation of our size."

Every day, Dodge Reports give Penker Construction the kind of advance information they need – in time to take action. Dodge Reports can do the same for your company – at surprisingly low cost – regardless of your size or scope. Send the coupon for further information. Or, consult your telephone directory for the Dodge office (in over 80 principal cities) nearest you.

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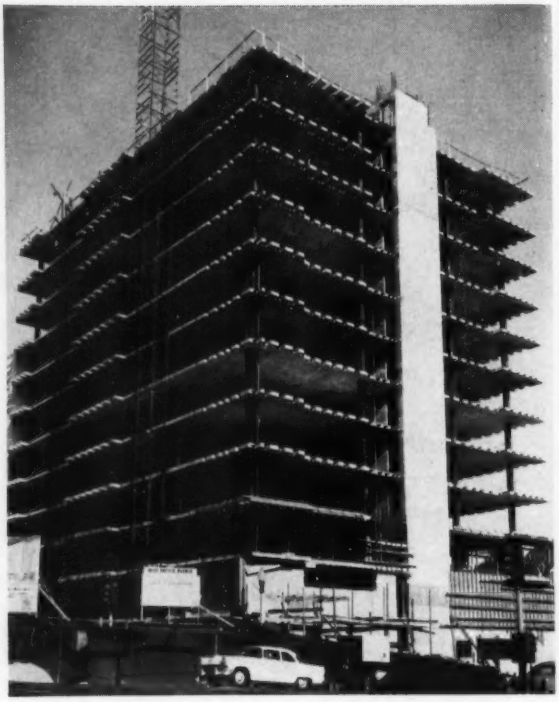

lift-slabs part on schedule

San Francisco, Calif.—Always a matter of some concern in lift-slab construction projects of any size, the problem of bond breaking received major attention in the planning of what is believed to be the world's tallest slip-form, lift-slab building. The project in question is a 73-unit high-rise apartment building.

With a total of thirteen 350-ton floor slabs to be cast one on top of the other, and then raised into final position hydraulically, even minor difficulty with bond breaking would have presented some king-sized headaches. After testing a number of products, a polymerized solution of organic and metal-organic compounds was selected to serve the dual purpose of curing agent and bond breaker. A troweling-in process was used because of the prevalence of hot, dry winds at the time the work was done. According to the builder no difficulty was experienced in parting any of the floor slabs during lifting operations.

The material used on this project was Thompson's Water Seal, manufactured by E. A. Thompson Co., 1355 Market St., San Francisco, Calif. The builder was George Belcher of San Francisco, August Waegemann was the structural engineer, and the lift-slab contractor was Vagtborg Lift-Slab Corp. The architect was the late H. C. Bauman.

architects, contractors agree on respective roles

The American Institute of Architects and the Associated General Contractors of America have reaffirmed their traditional views regarding the respective roles of architects and the general contractors.

"Architects and general contractors must work closely together and continue their traditional relationship to meet growing demands for more comprehensive service to the building owner," top officials from the two associations said in a joint statement resulting from a meeting in Las Vegas, Nevada.

The AIA's current efforts to explore means by which its members can increase the scope of their service will not affect—and are not intended to affect—the role of the general contractor or the present system of building contract administration, the statement said.

A new committee known as the AIA-AGC Liaison Committee, replaced the AIA-AGC Joint Cooperative Committee.

These points were approved by the two associations:

The AIA will continue to cooperate with AGC, as have the major specialty contracting associations, in improving and strengthening the single contract system.

The presidents and other officers of each association should meet periodically to consider responsibilities and problems.

Methods of exchanging information between the two organizations should be continued and improved.

The national organizations, separately and jointly, should stress the need for cooperation between local groups of architects and general contractors.

This Idler Roller Concrete Conveyor Never Needs Adjusting!

The trouble free belt conveyor that places 40 yards of concrete per hour, more than a crane swinging a ¾ yard bucket — at 1/10th the equipment cost and with fewer men on the job. And it handles forms and reinforcing steel as well. The Morgen Conveyor is the most versatile low cost material handling equipment available. It bridges over or under obstructions and elevates almost any material that can be poured or placed on the belt.

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All rollers are equipped with sealed for life ball bearings. Every load carrying and return idler is self aligning. They keep the belt running straight in spite of uneven loading and the tendency of a load to slip to the low side if the conveyor is not level.

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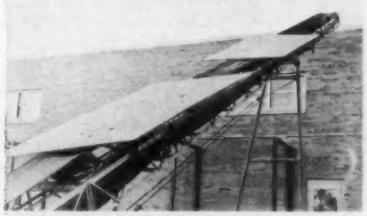
Morgen Conveyors are fully portable in lengths up to 48', discharge up to 33'. In addition to the self training idler roller conveyor, a lower cost pan-type is availible with all Morgen Features and reverse drive as well.



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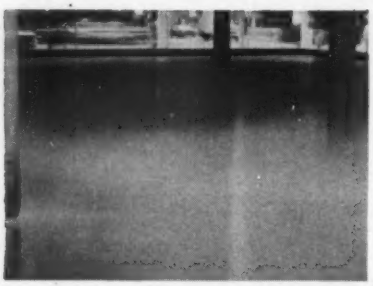

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DEKOTE, as a curing agent, retains 95% of the moisture in concrete to assure positive, complete hydration for maximum strength and hardness. It effectively seals concrete surfaces against most acids, oils, greases, and other foreign materials. Objectionable dusting, usually found in untreated concrete is eliminated.

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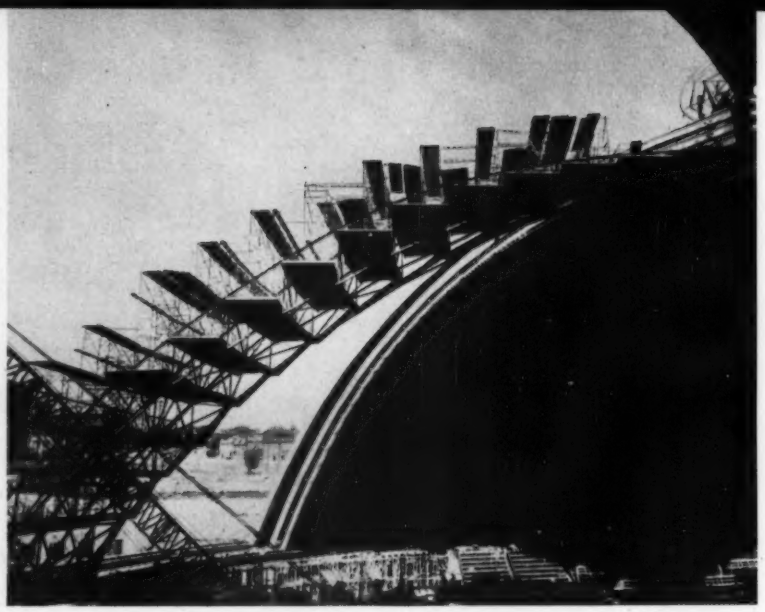


unusual scaffold

Pittsburgh, Pa.—An unusual application of commercial scaffolding facilitates work by mechanical trades on the 60-foot wide pie-shaped roof sections of Pittsburgh's 14,000-seat Civic Auditorium. Two special 150-foot high platforms, supporting the scaffolding, roll on rails to each of the permanent roof sections of the 417-foot diameter building. The moveable sections roll to the work platforms.

Trouble Saver scaffolding was supplied by The Patent Scaffolding Co., 38-21 12th St., Long Island City 1, N.Y. The contractor is the American Bridge. Co.

plastic sandwich makes waterseal

Los Angeles, Calif.—Something new has been achieved in the field of water-barrier construction with the apparently successful placement of a huge circular sheet of vinyl plastic between two slabs of concrete. The water barrier, a 72-foot diameter circular sheet, was fabricated on the job site to prevent water penetration in a 560,000-gallon reservoir.

The material is 20-thousandths of an inch thick and was supplied in sheets 54 inches wide. It was sandwiched between a bottom layer of unreinforced concrete 2 inches thick, and then covered with a 4-inch slab of reinforced concrete. It is believed that even though cracks may develop in the concrete due to earth shift, the plastic material will accommodate the resulting strains without breaking the water seal.

The Koroseal vinyl sheet was supplied by B. F. Goodrich Industrial Products Co., Marietta, Ohio. General contractor for the reservoir construction was C. E. Daniels Co., Long Beach, Calif.

literature

form catalog

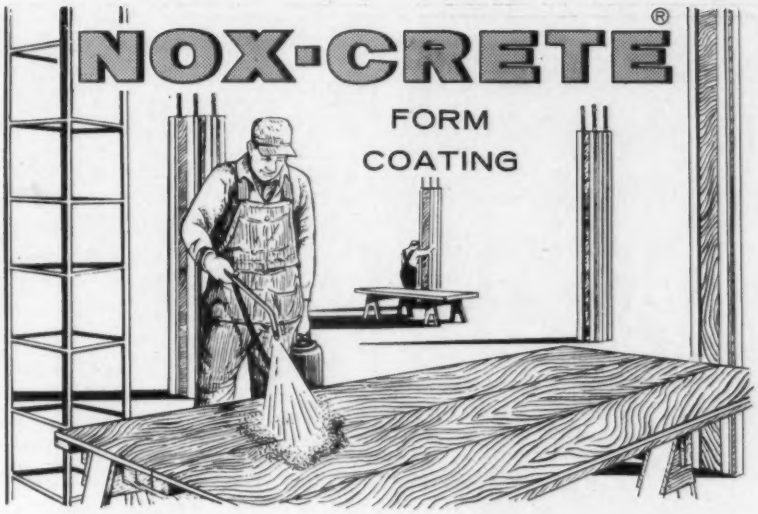
A new 20-page catalog gives information on the entire line of Symons Steel-Ply forms and illustrates with drawings and on-the-job photos. The catalog also describes forming products and accessories developed by the firm since the last catalog was issued, including gang forming bolts, all-steel pilaster forms and expanded information on the Lo-Wall Steel Trench form. Explanatory material on Symons ties and other products and accessories are also included. The final page describes this firm's free engineering and field services. Write Symons Clamp & Mfg. Co., Dept. C, 4249 W. Diversey, Chicago, Ill.

admixtures

Two liquid admixtures for concrete are described in folder CA-6A. One material is said to reduce water requirements without reduction of strength, increase durability and workability, and decrease shrinkage and permeability. Advantages claimed for the second material in warm weather operations include reduction of water requirements and shrinkage, and increased durability and 28-day compressive strength. Write Johns-Manville, Cement Additives Unit, 22 E. 40th St., New York, N. Y.

scaffolding accessories

A catalog includes photos, data and prices on suspended cable scaffolding, pump jacks, wall scaffold brackets, roof brackets, ladder accessories, adjustable steel scaffolding and other scaffolding equipment items. Write Newark Ladder and Bracket Co., Box 10, Clark, N. J.



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THE USE OF NOX-CRETE Form Coating more than *doubles* the life of wood forms... reduces form-cleaning to a minimum... saves time and money on every operation! NOX-CRETE Form Coating reacts chemically with concrete mix to prevent bonding between poured concrete and wood forms, and by-products of this chemical reaction waterproof the wood. NOX-CRETE Form Coating is equally effective on metal or fibre forms... reduces maintenance costs on patent forms by as much as 50%... makes fibre tube and box forms strip easily... acts as a rust-preventive on steel. Daily spraying of scoot-cretes, hoist buckets and mixers will keep concrete soft for easy removal. NOX-CRETE Form Coating covers up to twice the surface... costs less to use because the concrete mix itself supplies half the material for the bond-breaking chemical reaction. Call or write the distributor nearest you for detailed information and instruction sheets for all uses:

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Note these cost-saving features:

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- **Thompson's Water Seal permits eight or more pours per plywood form (min. 4 pours per side).**
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Thompson's Water Seal is deep penetrating, colorless, leaves no residue, won't stain concrete; surface is dust-free, ready for painting.

Available in 5 and 55 gallon drums from suppliers to the construction industry.

See catalog in Sweets Architectural file and Light Construction file.

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San Francisco, Los Angeles, San Diego, Portland, Chicago, Seattle, Denver, Dallas, Houston, St. Louis, St. Paul, Detroit, Philadelphia, New York City, Memphis, Tampa, Cleveland, Atlanta, Honolulu. Factory: King City, Calif. 5647R

concrete darkener

A catalog describes A. E. Dispersed Black, a semi-paste pigment for darkening concrete—air entrained or regular, monolithic or topping construction. The material is said to cause no reduction in air content of air entrained mixes and to offer uniform dispersion and greater color retention for sharply defining curbs, islands and traffic markings. Sun and headlight glare are reduced and de-icing of roads and sidewalks is facilitated through increased heat absorption. Descriptions, color values, uses, mixing instructions, testing procedures and quantity data are included in the catalog. A. C. Horn Companies, 750 Third Ave., New York, N. Y.

finish material

A folder describes a material which when added to a mix of portland cement, aggregate and water provides a coating material which will cover any concrete surface, interior or exterior, with a weather resistant and tenaciously bonded crackproof coating. The material can withstand wide temperature changes as well as high or low humidity, according to the manufacturer. It can be floated to a sand finish, or troweled to a hard, smooth finish. It is said to be adaptable to a variety of projects including swimming pools, monolithic concrete, prestressed concrete, floor resurfacing, dams, bridges, tunnels, overpasses, industrial floors, highways and waterproofing. Perma Glow, P. O. Box 668, Raceland, La.

forming booklet

The first part of this booklet is devoted to a reprint of an article "The Modern Way to Form Concrete." Other sections show this manufacturer's line of forms in use on a variety of projects, explain the engineering and field service which is available, and illustrate the accessories for use with the forms. Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago, Ill.

airport pavements

A 96-page illustrated book, "Design of Concrete Pavements for Airports," offers designers of airports descriptive information, data, tables, and design criteria for reinforced portland cement concrete pavement for airports handling all types of planes including jets. The book covers these major topics—basic factors in design; concrete pavement design fundamentals; subgrade, subbase and drainage; pavement thickness; reinforcement design; construction practices; concrete overlays; advantages of rein-

literature

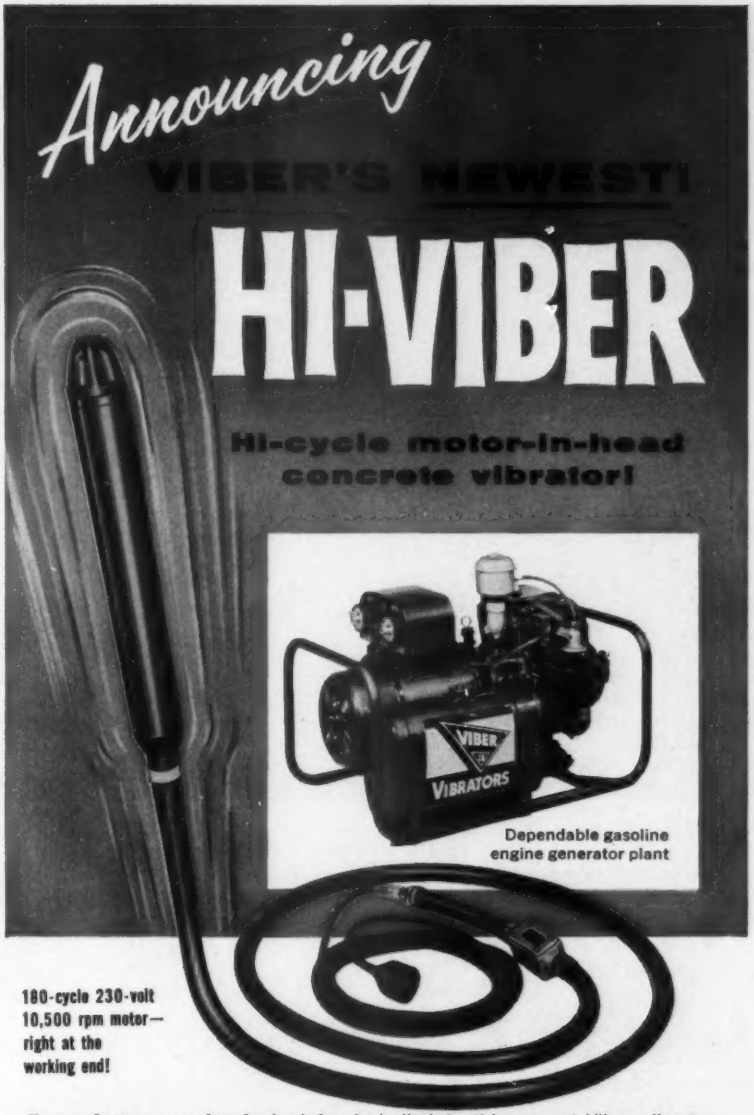
forcement; and welded wire fabric data. A copy of the book will be sent free if requested on your company letterhead. Write Wire Reinforcement Institute, Dept. AP-11, 1049 National Press Bldg., Washington, D. C.

forming system

An 8-page booklet shows step-by-step application of a concrete forming system which utilizes two types of heavy duty break-back ties, a Cam-Lock tie bracket, a stiff-back cam and a scaffold bracket. Designed to handle all types of construction from light to extremely heavy, the Cam-Lock system integrates with other Gates systems and also embodies the use of flexible, inexpensive forming materials. Gates & Sons, 80 S. Galapago, Denver, Colo.

admixture

A booklet describes an admixture for concrete and mortar that is said to accelerate hardening, increase early strength and reduce water requirements. The material is a clear concentrated solution of set accelerating agents in combination with a surface active agent that reduces water requirements of concrete and mortar. It is used in concrete, masonry mortar, maintenance work and manufacture of building units. The booklet may be obtained from Sonneborn Chemical and Refining Corp., Building Products Division, Dept. T, 404 Park Ave. South, New York, N. Y.



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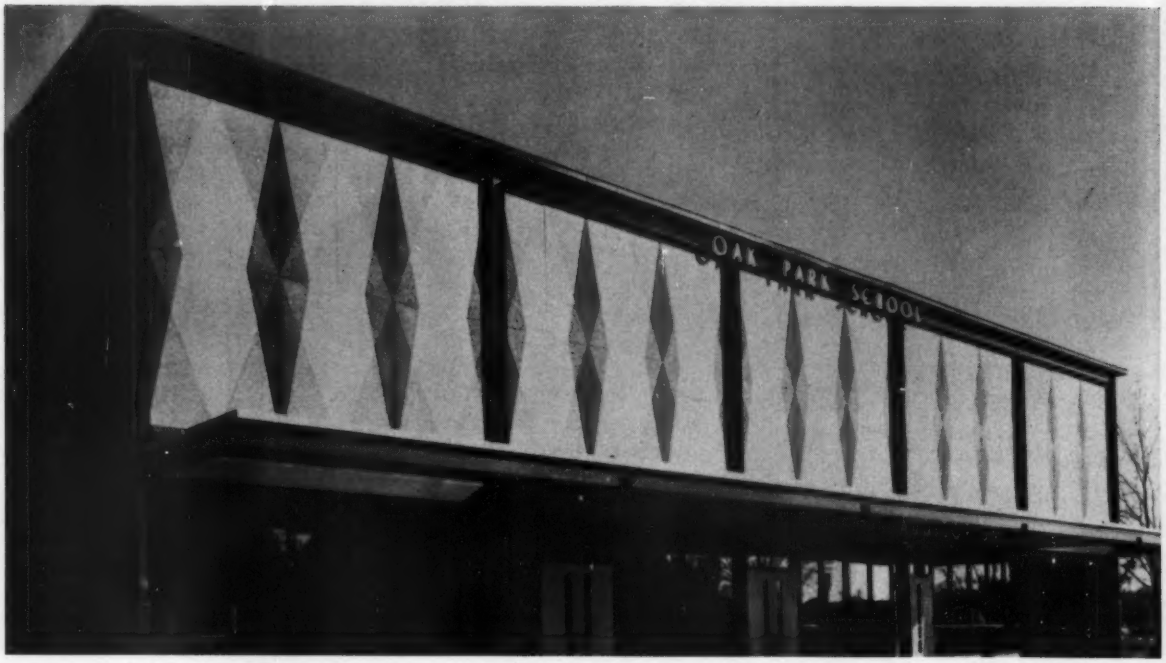
exposed aggregate work (see page 87 for description)



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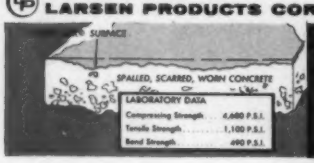

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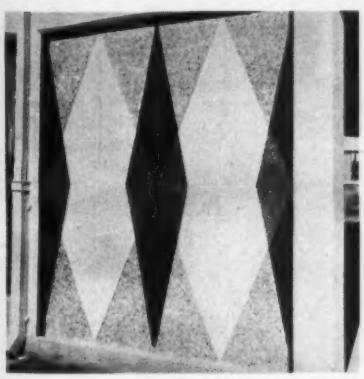
exposed aggregate work

Laurel, Miss.—The side walls of this city's new Oak Park School auditorium provide an excellent example of the fine decorative effects which can be achieved with exposed aggregate panels. The geometric wall panels were made face-down on concrete forms coated with a commercial retarder.



After casting the panels were left in the forms for a day and a half, then tilted and lifted out. The surface mortar was brushed and hosed off with water to expose the aggregate. The retarder affected the surface mortar to a depth of about ⅛ of an inch.

The pattern of the panels was achieved by using cements of various colors, kept separate by means of wood strips placed in the forms. Facing material was used for only a limited thickness of the panels, which were then bound together with a 2-inch layer of conventional concrete.

The Rugasol F. retarder used in this work was supplied by Sika Chemical Corp., Passaic, N. J. The Spectrone panels were made by the Jackson Stone Co., Box 873, Jackson, Miss.

New Remington Model EV-26 CONCRETE VIBRATOR

Now the world's most reliable, simplest-to-use, motor-in-head vibrator and only 2⅝" in diam.

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Now with the new Remington Model EV-26 you get a motor-in-head vibrator of exceptional reliability. Remington backs the Model EV-26 with a six-month guarantee, and it has capacity for fast work in walls, floors, footings and beams. You can plug it into any 110-volt line. The powerful motor kicks over at 10,000 vpm. A positive, 2-button, waterproof switch is conveniently located near the operator's hand. A special overload switch protects against motor burnouts on both AC and DC current.

The new Model EV-26 is economical and easy to use in one-man operation. It comes in 7', 14' or 21' hose lengths with 25' of special heavy-duty cord. Ask your distributor to show you the new Model EV-26 and the complete line of Remington concrete vibrators.

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